

REMARKS

Favorable reconsideration and allowance of the present application are respectfully requested in view of the following remarks. Claims 1-10 were pending prior to the Office Action. Claims 11-25 have been added through this Reply. Therefore, claims 1-25 are pending. Claims 1 and 11 are independent.

AMENDMENTS DO NOT ALTER SCOPE

In this Reply, claims 1-6 have been amended. However, the amendments were made merely to address informal issues such as grammar, antecedent basis, and clarity. It is intended that the scope of the claims remain substantially identical to the claims as originally presented.

OBJECTION TO THE SPECIFICATION

The specification is objected to for minor informalities. See *Office Action*, item 1. The specification has been amended to address this objection.

In addition, the title has been objected to for allegedly being not descriptive. While Applicants do not necessarily agree with this assertion, the title has been amended as

suggested to promote the progress of prosecution of this application.

Applicants respectfully request that the objection to the specification be withdrawn.

DRAWINGS

By this Reply, Figures 4 and 9 have been amended to enhance consistency with the specification and to enhance clarity. See above section entitled "Amendments to the Drawings." No new matter has been added. Applicants respectfully request that the drawings be accepted.

§ 103 REJECTION - Reed, Nakano

Claims 1 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Reed et al. (USPN 5,781,673, hereinafter "Reed") in view of Nakano (USPN 5,438,445). Applicants respectfully traverse.

For a Section 103 rejection to be proper, a *prima facie* case of obviousness must be established. See M.P.E.P. 2142. One requirement to establish *prima facie* case of obviousness is that there must be a suggestion or motivation within the cited reference(s) to modify the reference(s) as proposed in the

Office Action. See *M.P.E.P.* 2143.01. The cited reference must be considered in its entirety. See *M.P.E.P.* 2141.02. If the proposed modification renders the cited reference unsatisfactory for its intended purpose, then by definition, there is no suggestion or motivation to make the proposed modification. See *M.P.E.P.* 2143.01. Thus, if the proposed modification renders the cited reference unsatisfactory for its intended purpose, the rejection must also fail.

In this instance, independent claim 1 recites, in part, "a first optical fiber transmission path," "a second optical fiber transmission path," and "an optical repeater which ... wavelength-converts the received signal ... and outputs the wavelength-converted signal to said second optical fiber transmission path." Contrary to the assertion made in the Office Action, Reed cannot be modified by Nakano as suggested to obviate the claim.

More specifically, it is asserted in the Office Action that the dispersion compensating fiber (DCF) 13 of Reed is equivalent to the first optical fiber transmission path as claimed and that the dispersion slope compensating fiber (DSCF) 14 is equivalent to the second optical fiber transmission path as claimed. It is correctly admitted in the Office Action that Reed does not teach

or suggest the optical repeater as claimed. However, it is wrongly asserted that any conventional add/drop node, such as disclosed in Nakano, may be inserted between the DCF 13 and the DSCF 14 to obviate claim 1.

It is noted that Reed is directed to dispersion compensated wavelength division multiplexed (WDM) optical fiber communication system. See Reed, column 1, lines 6-8. Reed recognizes that a multichannel WDM optical fibers suffer from non-zero chromatic dispersion. See Reed, column 1, lines 15-19. In other words, for a given multiplexed signal, a particular optical fiber suffers from the chromatic dispersion.

Reed describes an apparatus in which the dispersion is minimized by first applying the multiplexed signal to a DCF of known positive dispersion rate and then connecting to a DSCF with a known negative dispersion rate to compensate for the dispersion caused in the DCF. More specifically, Reed describes a situation wherein a multiplexed signal (with wavelengths λ_1 , λ_2 , ... λ_n multiplexed) from a WDM transmitter 11 is inputted to the DCF 13. See Reed, Figure 1. The DCF 13 has a particular positive dispersion rate, in this instance 2 ps/km at wavelength λ_m . See Reed, Figure 3, the upward sloping part of the curve; Reed, column 3, lines 60-67. At the half way point (320 km in

this example), the DSCF 14 with a dispersion rate of -2 ps/km is attached to the DCF 13 to compensate. See Reed, *Figure 3, the downward sloping part of the curve; Reed, column 3, lines 60-67.*

It is important to note the following - that the **same multiplexed signal is carried on both the DCF 13 and the DSCF 14.** Note that the combination fiber (that is the combination of the DCF 13 and the DSCF 14) is designed so that the dispersion is centered about the wavelength λ_m at the WDM receiver 12. See Reed, *Figures 1 and 3; Reed, column 3, line 66 - column 4, line 12.* In other words, the combination fiber is viewed as a single unit designed to perfectly compensate a multichannel signal (or multiplexed signal) at wavelength λ_m .

For the sake of argument, it is assumed that the optical add/drop node disclosed in Nakano is like the repeater as claimed (point not agreed by the Applicants). Clearly, as suggested in the Office Action, if the add/drop node is inserted between the DCF 13 and the DSCF 14, no such compensation would occur.

More specifically, it is noted that the add/drop node must convert the input multiplexed signal (with wavelengths $\lambda_1, \lambda_2, \dots \lambda_n$ multiplexed) from the DCF 13 to an output multiplexed signal (with wavelengths $\lambda'_1, \lambda'_2, \dots \lambda'_n$ multiplexed), which would then

be connected to the DSCF 14. The wavelengths λ_1' , λ_2' , ... λ_n' multiplexed in the output multiplexed signal are not necessarily the same as the wavelengths λ_1 , λ_2 , ... λ_n of the input multiplexed signal.

However, the DSCF 14 is specifically designed to compensate for dispersion of the input multiplexed signal caused in the DCF 13. If the output multiplexed signal of differing wavelengths from the input multiplexed signal is to be carried by the DSCF 14, the compensation function would not be performed. Thus, the Reed would be left unsatisfactory for its intended purpose if the modification is made as suggested.

At best, the combination of the DCF and DSCF may be viewed as a single fiber unit designed to center a dispersion of a multiplexed signal about a particular wavelength λ_m . To the extent that a node may be inserted between the DCF 13 and the DSCF 14, the input and output multiplexed signals must carry identical wavelengths.

For at least the above stated reason, claim 1 is not rendered obvious by the combination of Reed and Nakano. Applicants respectfully request that the Section 103 rejection of claim 1, based on Reed and Nakano, be withdrawn.

§ 103 REJECTION - Reed, Tanaka

Claims 1, 2, 5, and 7-9 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Reed in view of Tanaka et al. (USPN 6,115,173, hereinafter "Tanaka"). Applicants respectfully traverse.

As noted above, with regard to independent claim 1, it has been shown above any introduction of a wavelength converting device in between the DCF 13 and DCF 14 renders Reed unsatisfactory for its intended purpose.

Tanaka has not been, and indeed cannot be, relied upon to correct for at least this deficiency. Indeed, with regard to claim 1, Tanaka has been relied upon to show that wavelength conversion is possible, and thus suffers from similar deficiency as with Nakano.

Therefore, independent claim 1 is distinguishable over the combination of Reed and Tanaka. Claims 2, 5, and 7-9 depend from independent claim 1 directly or indirectly. Therefore, these dependent claims are also distinguishable over the combination of Reed and Tanaka for at least the reasons stated above with respect to claim 1 as well as on their own merits.

Applicants respectfully request that the Section 103 rejection of claim 1, 2, 5, and 7-9, based on Reed and Tanaka, be withdrawn.

§ 103 REJECTION - Reed, Tanaka, Maki

Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Reed in view of Tanaka and in further view of Maki (USPN 6,118,561). Applicants respectfully traverse.

It is noted that claims 3 and 4 depend from independent claim 1. It has been shown above that modifying Reed with Tanaka as suggested in the Office Action renders Reed unsatisfactory for its intended purpose. Therefore, a rejection based on any combination involving Reed and Tanaka is improper.

Maki has not been, and indeed cannot be, relied upon to correct for at least this deficiency. Therefore, independent claim 1 is distinguishable over the combination of Reed, Tanaka, and Maki.

Claims 3 and 4 depend from independent claim 1. Thus, these dependent claims are also distinguishable over the combination of Reed, Tanaka, and Maki for at least the reasons

stated above with respect to claim 1 as well as on their own merits.

Applicants respectfully request that the Section 103 rejection of claims 3 and 4, based on Reed, Tanaka, and Maki, be withdrawn.

NEW CLAIMS

Claims 11-25 have been added through this reply. All new claims are believed to be distinguishable over the cited references, individually or in any combination.

Applicants respectfully requests that the claims 11-25 be allowed.

CONCLUSION

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance. Should there be any outstanding matters that need to be resolved, the Examiner is respectfully requested to contact Hyung Sohn (Reg. No. 44,346), to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1. 17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s): Replacement pages for Figures 4 and 9